

### Abstract

The disclosure relates to apparatus and methods that provide a system interconnect for transporting cells between nodes on a dual counter-rotating ring network, including a link selection register for selecting the shortest path to a destination node, use of a fault tolerant  
5 frequency reference to synchronize node clocks, interconnect initialization, multi-ring topologies along with an addressing schema and ring-to-ring couplers. The disclosure also discusses flow control of cells leaving nodes, coupling cells from one ring to another, and use of such an interconnect as a bus replacement.

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